ALL Consulting

"Technology Integrators for Government and Industry"

Environmental
Oil & Gas
Data Management
Computer / Networks

May 1, 2007

NDIC – Oil and Gas Research Program
State Capitol – 14th Floor
600 East Boulevard
Bismarck, North Dakota 58505

Subject: Letter of Commitment – Innovative Waste Management

Ladies and Gentlemen:

ALL Consulting hereby commits to pursuing and completing the attached research, if we are selected by the Oil and Gas Research Program. We commit to the objectives, timetable, reports, and budget described herein. We look forward to working with the Commission on this project.

Respectfully,
ALL Consulting

Bruce G. Langhus
Vice President

Innovative Practices for Managing Oilfield Wastes

in the Williston Basin of North Dakota

ALL Consulting and PetroComp

Principal Investigator:

J. Daniel Arthur, P.E.

ALL Consulting

1718 S. Cheyenne Ave.

Tulsa, Oklahoma 74119

May 1, 2007

Amount Requested: $100,000

Matching Funds: $150,000

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ABSTRACT

ALL and PetroComp propose to combine expertise to define recommended practices for managing oilfield wastes in North Dakota. Oil-based mud, produced liquids, tank bottoms, oily dirt, stimulation flow-back, and other RCRA-exempt substances can be managed in an economical manner, however, regulators, operators, and contractors need to know how to best manage these wastes so that soil, air, and water remain protected. Oilfield wastes can be managed by disposal, treatment via surface spreading or composting, and by burning to recover energy. The proposed research aims to define management methods, clean-up limits, monitoring schemes, and reporting procedures.

Oilfield wastes can contain a wide range of compounds from inorganic salts to complex organic polymers; the variety can create problems with efficient waste management. The proposed research will collate constituents in produced fluids and completion and stimulation fluids commonly used in the Williston Basin. In addition the researchers will list available treatment options. The resulting waste matrix will match waste origin, compounds of concern, and treatment options.

Oilfield wastes can be managed by way of direct burial, surface spreading, composting, or combustion to recover energy. Each of these procedures is effective for certain kinds of wastes and each is effective down to certain clean-up levels that are partly process-based and partly time-dependent. Several procedures may be required to achieve the desired clean-up level. Research will focus on identifying risk-based clean-up levels that are achievable given available technology, are reasonable in cost and time-frame. Risk-based clean-up levels can be matched to various compounds of concern and geographical settings. Clean-up levels need to be determined by adequate monitoring schemes. The research will suggest compound-based and risk-based monitoring of soil, groundwater, surface water, and air as well as appropriate reporting schedules.

The results of this research can be used by regulators to write oilfield waste management regulations and by operators and contractors to manage waste with the greatest efficiency.

PROJECT DESCRIPTION

Oilfield wastes can present problems for oil and gas operators, contractors, and regulators. In particular, innovative management options, risk-based clean-up levels, environmental monitoring, and reporting need research. The proposed research will investigate these aspects and arrange them into a detailed, accessible matrix that can be referenced by industry and government and general public to help the state of North Dakota manage oilfield wastes in a practical and prudent manner.

Objectives

Researchers will focus on objectives that clarify oil and gas waste management options:

- **Waste Classification:** Researchers will determine the rationale behind the classification of common oilfield wastes in addition to those shown in partial EPA table shown above. This would include, for example, treatment wastes from produced water treatment plants so common in the Powder River Basin and filter pressings left over after chemical treatment of E&P wastes.
- **Waste Management Options:** Researchers will catalogue the costs, regulatory burden, and potential liabilities of disposal such as deep injection, burial, and land-filling. These options may not be available to all waste types.
- **Clean-up Levels:** Relevant literature will augment the proprietary experience gained by PetroComp to determine practical, risk-based clean-up levels for these technologies.
- **Monitoring and Reporting Frequency:** Researchers will correlate new management methods with existing procedures and suggest appropriate monitoring schemes and reporting schedules.

Oilfield Wastes

Many substances can become wastes in contemporary oil and gas fields such as those found in the Williston basin of North Dakota. Oilfield wastes must be defined in terms of the Resource Conservation and Recovery Act (RCRA) of 1976 and in particular Subtitle C of the Act. In 1980, Congress exempted specific oil and gas wastes that were intrinsic to primary exploration and production activities. The following is a short summary of those wastes:

Table 1: RCRA Wastes	
Exempt E&P Wastes	**Non-Exempt Wastes**
Used workover, fracturing, stimulation, and acidizing fluids	Un-used workover, fracturing, stimulation, and acidizing fluids
Produced sediment	Lube oil and hydraulic fluids
Drilling mud and solids	Solvents used for equipment maintenance
Produced water	Service company wastes
BS&W from crude tanks	Compressor fluids
Crude oil impacted soil and water	Soil and water impacted by motor fuels

Each of the exempt wastes listed above can contain a variety of constituents that complicate management, for example, impacted soil might contain light or heavy crude oil, asphalt, waxes, or naturally occurring radioactive material (NORM). Each component will need to be treated differently. Likewise, workover fluids will vary from one service contractor to another.

Waste Management Options

Oilfield waste streams may be managed in several traditional and innovative ways including disposal, treatment, re-use, or combustion for energy recovery. For example, produced water can be separated from the hydrocarbons and then filtered and re-used for reservoir pressure-maintenance or watering livestock. Operators filter oil-based drilling mud, re-use the clean portion, compost the oily cuttings or burn the waste and recover the energy. Each option will have its advantages and disadvantages; each option will be more suited to some wastes than others. It may be advantageous to segregate RCRA-exempt from non-exempt wastes to allow full flexibility in management and reporting. At other times it may be more cost-effective to combine the wastes during treatment. The following are some innovative management options that will be considered:

Incineration and Energy Recovery: Oil-based mud, cuttings, impacted soil, and tank bottoms can contain sufficient oil to be flammable. Specialized boilers take advantage of this fuel to produce both electric power and hot water. The power can be used in-house or sold and the heat can be used to

remove more oil from wastes. Thereafter, the boiler waste may need to be buried in a segregated portion of a permitted special landfill.

Composting: Composting consists of aerobic bio-chemical treatment of organic waste leaving a stabilized by-product. Hydrocarbon contaminated material such as soil, cuttings, absorbent material, etc. can be composted by adding organic bulking agents such as manure with water and fertilizer as needed. The composting action by in-situ microbes preferentially consumes the more accessible, lighter compounds that have lower carbon-numbers; the residue is enriched in inert, heavier compounds often with sulfur-bearing compounds such as asphaltenes. The residue is, therefore, made less biologically active and less environmentally threatening by the composting process. A risk-based clean-up level could be made higher for composted material. Compost facilities may need to be geo-membrane-lined in some locations where groundwater is near the surface while other locations may be sufficiently separated from vulnerable groundwater resources. Groundwater monitoring will be site-specific consisting of monitoring wells or leachate monitoring.

Disposal: Oilfield wastes after treatment may need to be disposed of in some environmentally conservative manner. This might include burial or deep injection into a well. Burial options will include earthen pit or geo-membrane-lined pit; the choice will be determined by character of the waste and risk-based assessment of the geo-hydrology of the specific site. An earthen pit may require local groundwater monitoring. Water is by far the bulk of the waste stream at oil and gas facilities; E&P waste water is often injected into the subsurface with a deep well. Disposal wells can be of several types, although all will be permitted as Class II facilities. Injection zones can have variable porosity and permeability. Injection pressures can range from almost zero to high; this will be determined by the contents of the reservoir and its permeability. Class II enhanced recovery wells inject water into oil producing reservoirs in order to increase local oil production. Class II slurry injection wells have sufficient porosity and permeability to accept water slurries containing drilling wastes or similar solids; these wells often are cavernous reservoirs. Class II injection wells have an excellent safety record and usually do not require monitoring except for periodic mechanical integrity

testing. Class I (industrial, RCRA wastes) disposal wells are not anticipated in this project, therefore, if deep well disposal is anticipated, then exempt and non-exempt wastes must be segregated in order to avoid mixing.

Land-farming: Some wastes can be spread on the surface and then encouraged to grow groundcover crops such as grass or hay. Contaminated soil with low levels of less reactive hydrocarbons can be farmed, especially if the salinity of the material is not high. The waste is tilled into the soil and suitable fertilizer is applied. If the soil is heavy and clayey, an organic agent such as mulch or manure can be added to improve soil condition and aeration. In situ microbes will consume most of the hydrocarbons in a short time if sufficient moisture is available and the soil is tilled on a regular schedule. The impacted soil can be left in place or spread on pasture or cropland as needed. Monitoring of the removal process can be accomplished according to a suitable schedule. The clean-up level will largely be determined by treatment time and local conditions of moisture and temperature.

Clean-up Levels

Clean-up levels that are possible with each waste management option will be determined by the process, by the constituents of the waste, by the local conditions of temperature and precipitation, and by the time allowed for treatment. Research will focus on results achieved by PetroComp in the Williston Basin and published data for other sites in North America. In addition the research will determine regulatory limits in other oil and gas producing states that are relevant to these waste management methods.

Waste Management Matrix

The following is a partial list of management options and types of E&P, RCRA-exempt wastes.

Management Option	E & P Wastes	Clean-Up Level	Reco-mended Limits	Clean-Up Monitoring	Environ-mental Monitoring	Permits
Power Generation	Oil-base mud, oily cuttings, oil-contaminated soil, tank bottoms, etc.	Very low	?	None	Air quality	Air Quality, special landfill
Composting	Oil-base mud, oily cuttings, oil-contaminated soil, tank bottoms, etc.	High	?	Yes	Groundwater, runoff, etc.	Special Landfill
Land-farming	Low-level oily soil, etc.	High	?	Yes	Runoff	Special Landfill
Burial	Anything	High	?	None	None	Special Landfill
Deep Injection	Waste water	NA	anything	NA	None	Class II UIC
Deep Injection	Slurry	NA	anything	NA	None	Class II UIC

This research effort will generate a more detailed, more complete matrix comparing management methods that result in options that are both achievable and protective. In addition the matrix highlights those monitoring practices that make particular sense. The matrix can also be valuable for an E & P waste facility within the Williston Basin of North Dakota.

Technological and Economic Impacts of the Research

It is anticipated that research will result in a waste management "Toolbox" for the oil and gas industry of North Dakota. Industry and regulators will gain flexibility for handling oil and gas wastes leading to lower costs and greater freedom. The objectives of the focused research will be specifically described in progress reports and final report.

STANDARDS OF SUCCESS

Stakeholders in the petroleum sector will benefit from the publication of an expanded and readily available waste management "Toolbox" in accordance with the objectives of the proposed research. It is anticipated that the final research product will be utilized by:

- Waste contractors as a resource to identify waste management options and corresponding operational limits. For example, waste handlers will be able to identify the necessary permits needed to recover energy from oily soil or how to equip a compliant slurry disposal well.

- Operators to identify waste management options, costs, and time-frames for specific E&P wastes. For example, an operator needing to empty a large reserve pit will be able to review the available options so as to minimize transportation and handling/disposal costs.
- Regulators to compare the relative levels of environmental protection provided by the various waste management methods. Regulators will also be able to compare clean-up criteria for a specific technology between neighboring states. This will allow identification of opportunities for regulatory streamlining and cost efficiency.
- The state legislature to measure the degree of oil industry acceptance that exists in the state.
- Private citizens to learn about the environmental protections provided by generally accepted industry practices in regards to E&P waste management.

Overall, it is anticipated that this research will facilitate E&P waste management; the comparison of available options will help to effectively lower waste management costs. Furthermore, it will provide a comparison of time required for each technology which will aid producers in selecting between, for instance, the typically rapid but higher cost land-filling option versus more environmentally sustainable options such as treatment by composting. Each method has its own associated costs, advantages, and disadvantages. By presenting this information side-by-side, it is anticipated that operators will be able to more effectively manage their waste streams and associated costs.

The facility that forms the basis for this research is located in Bowman County, North Dakota adjacent to producing areas of Montana, Wyoming, North Dakota, and South Dakota. This broad-spectrum facility will draw business from a large part of the Williston Basin, Cedar Creek Anticline, and the Powder River Basin producing areas.

BACKGROUND AND QUALIFICATIONS

ALL Consulting: This small business geo-technical consultancy has been active in petroleum waste management since its inception in 1999. J. Daniel Arthur P.E., Greg Casey P.E., and Bruce Langhus, Ph.D. have worked on a number of projects concerning waste management including subsurface injection (Class I, II, and V), impoundment design, and general facility management. The staff has

designed and permitted waste facilities in Montana, Wyoming, Oklahoma, and Texas. ALL is a recognized expert in the field of petroleum waste management through its success with research projects for the US Dept. of Energy, the State of Wyoming, the State of Montana, and the Ground Water Protection Council. ALL has conducted related projects for large corporate clients such as Chevron, Conoco Phillips, Encore Acquisition, Anadarko, and Fidelity Exploration and Production. Throughout this work, ALL has developed a keen sense of the variability of waste management problems and solutions; it is crystal-clear that the most important aspect of petroleum waste is to maximize the operator's toolbox, allowing him to choose the best option.

PetroComp: This waste contractor has operator waste management facilities near Baker, Montana for 13 years. The facilities include waste trucking, Class II disposal wells, composting, land-farm, and waste treatment. The contractor is preparing a general use waste management facility in Bowman County, North Dakota that will treat a broad spectrum of petroleum wastes from North Dakota, South Dakota, and Montana.

Biographies of the principals are shown below:

J. Daniel Arthur, P.E. **ALL Consulting**

Mr. Arthur is a registered professional engineer in the states of Oklahoma, Florida, Montana and Wyoming. He earned his Bachelors of Science (BS) Degree in Engineering from the University of Missouri-Rolla and has received certification as a Senior Project Manager. Mr. Arthur has 19 years of experience and has gained national recognition as a technologist and environmental regulatory advisor. Mr. Arthur is a founder of ALL and currently serves as Managing Partner. He serves as Project Manager for several projects delivered by ALL, including work performed for both government and private sector clients. He is a recognized authority on management of oilfield waste.

Bruce G. Langhus, Ph.D., C.P.G. **ALL Consulting**

Dr. Langhus is a lead geologist and hydrologist for ALL; he holds three degrees in Geology including a Ph.D. He has over 40 years' experience in petroleum exploration and production including work in conventional oil and gas, CBM, and coal geology. Before becoming a consultant he directed the

Oklahoma Corporation Commissions' underground injection program. He commonly consults to major oil companies on exploration and production technologies including innovative produced water management. Dr. Langhus has served as Project Manager, Chief Hydro-geologist, and Senior Reviewer for several Environmental Investigations and Remediation Investigations. Dr. Langhus directed a multi-state regulatory cost reduction effort aimed at the up-stream oil and gas industry; he is an authority on economical management of waste water.

Greg Casey, P.E. **ALL Consulting**

Mr. Casey has more than 15 years of experience in underground injection well design, evaluation, workover, testing and permitting, drilling, waste planning, and environmental site characterizations, remedial investigations, and hydro-geologic investigations. He is the primary author of plugging and abandonment portion of the Class II injection well Mid-Course Evaluation effort for EPA. Mr. Casey managed, provided initial design and permit application preparation for 14 Class I (Hazardous and Non-Hazardous waste) injection wells for industrial facilities in Northeast Texas, South Texas, central Oklahoma and Central California.

Dale Leivestad, CEO **PetroComp**

Mr. Leivestad has operated the PetroComp waste facility at Baker, Montana for 13 years. His facility has served the needs of oil and gas operators on the Cedar Creek Anticline.

MANAGEMENT

Much like US DOE and similar projects, ALL will manage this 12-month research projects by way of its proprietary Time & Billing database and reporting system. The computer system allows the company to report tasks, hours, and billing amounts tracked to both the NDIC and PetroComp. Progress reports will be submitted to the NDIC at the end of each quarter and at the end of the project. Final report will be submitted in both hardcopy and electronic formats. Project management will be under J. Daniel Arthur, P.E. who is a certified Senior Project Manager; he currently serves as Project Manager for several very large projects delivered by ALL, including work performed for both government and private sector clients.

TIMETABLE

The project will require 12 months to complete. It is assumed for this proposal that funding will begin on July 1, 2007. The following reporting elements will be submitted before the following dates:

1. First Quarter (July 1 to October 1) progress report will be submitted by October 15.
2. Second Quarter (October 1 to January 1, 2008) progress report will be submitted by January 15, 2008.
3. Third Quarter (January 1 to April 1, 2008) progress report will be submitted by April 15, 2008.
4. Final Report (through July 1, 2008) will be submitted by July 31, 2008.

In addition, monthly invoices with short progress summaries will be submitted monthly.

BUDGET

The budget for this proposed research is presented below. Direct labor charges are itemized for each of the five tasks including reporting. In addition the other direct costs are summarized in a single panel; these costs are spread throughout the five tasks. The last panel summarizes total costs ($249,539.60), NDIC grant request ($99,539.60), PetroComp financial contribution ($75,000), and PetroComp in-kind contribution ($75,000). Total cost share is approximately 60.11%. NDIC grant is vital to making these research findings public so that they can be accessed by all operators in the basin, by regulators, and by the general public. Without grant funds, the findings will remain proprietary to the principals.

ALL Consulting

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PetroComp

New Project Budget Request Estimate

PROGRAM:	**North Dakota Industrial Commission**
SOLICITATION NUMBER:	
TITLE:	**Best Practices for Managing Oilfield Wastes in the Williston Basin of North Dakota**
LOCATION:	**Williston Basin, Northwest North Dakota**

No.	DURATION	TASK DESCRIPTION	DISCIPLINES	BASIS	2007 RATE	MAN HOURS	LABOR COST
Task 1	2 months	**Waste Classification:** Actual field derived wastes will be sampled from various typical drilling and operational activities to include both RCRA exempt and non-exempt waste stream.	Project Director (ALL Sr. Consultant)	GSA - EAS	$ 120.00	8	$ 960.00
			Project Manager (ALL Sr. Staff)	GSA - EAS	$ 115.00	16	$ 1,840.00
			Senior Staff (ALL)	GSA - EAS	$ 109.00	24	$ 2,616.00
			Staff Engineer (ALL)	GSA - EAS	$ 96.00	0	$ -
			Staff Scientist (ALL)	GSA - EAS	$ 90.00	80	$ 7,200.00
			Computer Technician (ALL)	GSA - EAS	$ 60.00	0	$ -
			Admin Assistant (ALL)	GSA - EAS	$ 40.00	24	$ 960.00
					Total Direct Labor	**152**	**$ 13,576.00**
	Task Total:	**$ 13,576.00**					

No.	DURATION	TASK DESCRIPTION	DISCIPLINES	BASIS	2004 RATE	MAN HOURS	LABOR COST
Task 2	2 months	**Waste Management Options:** Options for each of the waste streams including waste streams with complicated constituents will be investigated to determine the beneficial reuse capability, effective volume, proximity to the Williston Basin.	Project Director (ALL Sr. Consultant)	GSA - EAS	$ 120.00	8	$ 960.00
			Project Manager (ALL Sr. Staff)	GSA - EAS	$ 115.00	40	$ 4,600.00
			Senior Staff (ALL)	GSA - EAS	$ 109.00	80	$ 8,720.00
			Staff Engineer (ALL)	GSA - EAS	$ 96.00	40	$ 3,840.00
			Staff Scientist (ALL)	GSA - EAS	$ 90.00	160	$ 14,400.00
			Computer Technician (ALL)	GSA - EAS	$ 60.00	0	$ -
			Admin Assistant (ALL)	GSA - EAS	$ 40.00	40	$ 1,600.00
					Total Direct Labor	**368**	**$ 34,120.00**
	Task Total:	**$ 34,120.00**					

No.	DURATION	TASK DESCRIPTION	DISCIPLINES	BASIS	2004 RATE	MAN HOURS	LABOR COST
Task 3	3 months	**Clean-up Levels:** Identify an understanding of clean-up levels for specific conditions, waste components, and locations. Document the rationale and appropriate monitoring necessary to support these proposed levels.	Project Director (ALL Sr. Consultant)	GSA - EAS	$ 120.00	8	$ 960.00
			Project Manager (ALL Sr. Staff)	GSA - EAS	$ 115.00	32	$ 3,680.00
			Senior Staff (ALL)	GSA - EAS	$ 109.00	64	$ 6,976.00
			Staff Engineer (ALL)	GSA - EAS	$ 96.00	0	$ -
			Staff Scientist (ALL)	GSA - EAS	$ 90.00	200	$ 18,000.00
			Computer Technician (ALL)	GSA - EAS	$ 60.00	0	$ -
			Admin Assistant (ALL)	GSA - EAS	$ 40.00	24	$ 960.00
					Total Direct Labor	**328**	**$ 30,576.00**
	Task Total:	**$ 30,576.00**					

No.	DURATION	TASK DESCRIPTION	DISCIPLINES	BASIS	2004 RATE	MAN HOURS	LABOR COST
Task 4	3 months	**Monitoring Requirments:** Define required monitoring and model management options verses waste stream to support clean-up levels with appropriate monitoring. Identify legislative implications and opportunities for monitoring support.	Project Director (ALL Sr. Consultant)	GSA - EAS	$ 120.00	8	$ 960.00
			Project Manager (ALL Sr. Staff)	GSA - EAS	$ 115.00	40	$ 4,600.00
			Senior Staff (ALL)	GSA - EAS	$ 109.00	80	$ 8,720.00
			Staff Engineer (ALL)	GSA - EAS	$ 96.00	24	$ 2,304.00
			Staff Scientist (ALL)	GSA - EAS	$ 90.00	120	$ 10,800.00
			Computer Technician (ALL)	GSA - EAS	$ 60.00	160	$ 9,600.00
			Admin Assistant (ALL)	GSA - EAS	$ 40.00	32	$ 1,280.00
					Total Direct Labor	**464**	**$ 38,264.00**
	Task Total:	**$ 38,264.00**					

No.	DURATION	TASK DESCRIPTION	DISCIPLINES	BASIS	2004 RATE	MAN HOURS	LABOR COST
Task 5	2 months	**Quarterly and Final Reports:**	Project Director (ALL Sr. Consultant)	GSA - EAS	$ 120.00	16	$ 1,920.00
			Project Manager (ALL Sr. Staff)	GSA - EAS	$ 115.00	64	$ 7,360.00
			Senior Staff (ALL)	GSA - EAS	$ 109.00	120	$ 13,080.00
			Staff Engineer (ALL)	GSA - EAS	$ 96.00	40	$ 3,840.00
			Staff Scientist (ALL)	GSA - EAS	$ 90.00	160	$ 14,400.00
			Computer Technician (ALL)	GSA - EAS	$ 60.00	0	$ -
			Admin Assistant (ALL)	GSA - EAS	$ 40.00	40	$ 1,600.00
					Total Direct Labor	**440**	**$ 42,200.00**
	Task Total:	**$ 42,200.00**					

Other Direct Costs for all Tasks		
	Travel Purpose: Travel Purpose: Kick-off meeting, Project Manager and one staff member, assume trip is two days and held in Williston, ND. Immediately following the Kick-off meeting a one-week field effort will be conducted to gather waste stream samples from various locations.	
Task Total:	**$**	**15,803.60**

Other Direct Costs

TRAVEL	BASIS	RATE	QUANTITY	TOTAL
AIRFARE ROUND TRIP/EACH (Meeting)	Past Trips	$ 650.00	2	$ 1,300.00
LODGING/DAILY	JTR Rate	$ 75.00	10	$ 750.00
PER DIAM/DAILY	JTR Rate	$ 40.00	12	$ 480.00
RENTAL CAR & FUEL/DAILY	Past Trips	$ 75.00	6	$ 450.00
			TOTAL:	**$ 2,980.00**
EQUIPMENT	**BASIS**	**RATE**	**QUANTITY**	**TOTAL**
COMMUNICATIONS (Phone, Fax, E-mail)	Historical Refer	$ 2.50	1752	$ 4,380.00
COMPUTERS/LAP TOPS/PDAs	Historical Refer	$ 1.50	1752	$ 2,628.00
Web Page Portal Sever Hosting/Month	Web Page	$ 150.00	0	$ -
			TOTAL:	**$ 7,008.00**
SUPPLIES	**BASIS**	**RATE**	**QUANTITY**	**TOTAL**
COLOR COPIES	Vendor Quote	$ 0.80	0	$ -
REPRODUCTION COSTS (36"X48")	Vendor Quote	$ 2.00	0	$ -
REPRODUCTION (8.5"X11")(11"x17")	Vendor Quote	$ 0.08	0	$ -
			TOTAL:	**$ -**
CONTRACTUAL	**BASIS**	**RATE**	**QUANTITY**	**TOTAL**
LABORATORY ANALYSES	Historical Refer	$ 1,000.00	5	$ 5,000.00
BULK SHIPPING	Vendor Quote	$ 50.00	5	$ 250.00
SHIPPING OVERNIGHT	Vendor Quote	$ 14.14	40	$ 565.60
			TOTAL:	**$ 5,815.60**
			TOTAL ODCs:	**$ 15,803.60**

Total Estimated Labor Hours:		**1752**
Total Estimated Labor Cost:	**$**	**158,736.00**
Total Estimated Expenses:	**$**	**15,803.60**
ALL Consulting Sub-Total:	**$**	**174,539.60**
PetroComp Finacial Support	**$**	**75,000.00**
Total New Grant Budget Request Estimate:	**$**	**99,539.60**

Summary of Costs		
Total New Grant Budget Request Estimate	**$**	**99,539.60**
PetroComp and Industry In-Kind Contribution (Cost Share)	**$**	**75,000.00**
PetroComps Finacial Contribution	**$**	**75,000.00**
TOTAL PROJECT ESTIMATED COST	**$**	**249,539.60**
TOTAL ESTIMATE COST SHARE		**60.11%**

TAX LIABILITY

I, Bruce Langhus Vice President of ALL Consulting, affirm that this company has no outstanding tax liabilities owed to the State of North Dakota or any of its political subdivisions.

_____ _____

Bruce G. Langhus Date